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## COLONIZATION OF JAPANESE BEETLE PARASITES IN 1939

By J. L. King, senior entomologist, and  
L. B. Parker<sup>1</sup>, assistant entomologist,  
Division of Fruit Insect Investigations,  
United States Department of Agriculture

During the active season of 1939 the parasite-colonization work at the Japanese beetle laboratory at Moorestown, N.J., was confined entirely to the placement of new colonies of Tiphia species largely within the boundaries of generally infested States.

New importations of Tiphia popilliavora (Korean strain) were also made for rearing purposes, as the older rearing stock had diminished in vitality to such an extent that no colonization of this later strain was accomplished in 1939.

The Spring Tiphia, Tiphia vernalis Roh.

Colonization in Maryland.--The beetle-infested area in Maryland was visited by representatives of the Bureau of Entomology and Plant Quarantine, in company with members of the cooperating group of the University of Maryland in order to select new areas for parasite colonization. A number of areas were selected and surveyed as to host population and on May 17 the work of colonization was started. The liberation of 40 new colonies was made in 11 counties in Maryland in 1939, which brings the total colonies of T. vernalis to 375 in this State. The releasements in 1939, in addition to 3 made in the city of Baltimore, were made in the following counties: Cecil, 5; Frederick, 5; Baltimore, 2; Kent, 5; Harford, 7; Worcester, 3; Howard, 2; Prince Georges, 3; Anne Arundel, 2; Queen Annes, 2; and Talbot, 1.

Colonization in New York State.--Westchester County, which is heavily infested by the Japanese beetle, was surveyed by a representative of the New York Agricultural Experiment Station at Geneva, N.Y., working cooperatively with Bureau representatives. The habitats selected seem ideal and should yield most favorable results in the future. There were 50 releasements made in New York in 1939, which brings the total releasements of this species to 62 in that State. The 1939 colonies were released in the following counties: Westchester, 44; Rockland, 2; Tioga, 2; Chemung, 1; and Monroe, 1.

<sup>1</sup>/ The writers acknowledge the assistance of their associates, J. W. Balock and H. J. Willard, who were actively engaged in the many phases of work associated with the rearing, collecting, and distribution of parasites.

Colonization in Connecticut.—Cooperative work with the Connecticut Agricultural Experiment Station at New Haven continued as in the past. A total of 25 colonies were released in 1939, thus bringing the final number of colonies of T. vernalis to 49. The 1939 releasements were made in the following counties: Fairfield, 12; New Haven, 8; Hartford, 4; and New London, 1.

Colonization in New Jersey.—Heavy beetle infestations still prevail in sections of northern New Jersey. It is planned to colonize these as time and material permit. Ten colonies were released in this area in 1939, which brings the total colonies in New Jersey to 299. The 1939 releasements of T. vernalis were made in the following counties: Hunterdon, 7; Somerset, 2; and Morris, 1.

Colonization in Pennsylvania.—The western spread of the beetle in Pennsylvania has advanced rapidly in the last few years, but it has been impossible to keep pace with this and meet all requests for parasite colonies. In 1939, however, the heavily infested Chester County received 10 colonies, which brings the total of this species to 427 in Pennsylvania.

Colonization in Delaware.—Although the northern part of Delaware is heavily infested, the habitats are not ideal for T. vernalis; however, 10 colonies were liberated in the State with the hope of bettering parasite distribution in that area and to supplement the adjacent heavily colonized areas in Maryland. Delaware has now a total of 52 colonies of T. vernalis. The 1939 liberations were made with 6 colonies in New Castle County and 4 in Kent County.

The accompanying map shows in general the total distribution of the 1,272 colonies of T. vernalis.

Parasitization of beetle larvae by Tiphia vernalis.—Surveys were conducted during the springs of 1935, 1936, and 1939 to determine the effectiveness of T. vernalis as a parasite of the grubs of the Japanese beetle. A pasture at Rushland, Pa., was selected for this purpose and in each survey 2 percent of a designated 10,000-square-foot area was dug to determine the status of the species. This entailed the digging of 200 holes 1 foot square over the entire plot, each hole being dug to a depth of 6 inches and its entire content noted. The following table gives the chief finding for the periods observed.

Year of survey	Total grub population		Average grubs per square foot		Unparasitized grubs		Parasitized grubs	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1935 .....	1,146	---	5.73	---	444	38.74	702	61.25
1936 .....	816	---	4.90	---	429	52.57	388	47.55
1939 .....	1,054	---	5.27	---	548	51.99	506	48.00



The Summer Tiphia, Tiphia popilliavora Roh.

Owing to the late-season occurrence of third-stage host grubs in 1938, the abundance of female T. popilliavora parasites was much reduced in 1939 and colonization was, therefore, necessarily limited. During the somewhat delayed collecting period, 3,300 females were taken and were distributed in 33 colonies.

Colonization in Maryland.---Continuing cooperation with the State enabled the Bureau workers to place 10 more colonies of this species in Maryland in 1939, thus raising the total colonies of this species in this State to 85. The 1939 liberations were made in the following counties: Somerset, 2; Worcester, 1; Queen Annes, 1; Caroline, 1; Wicomico, 1; Prince Georges, 3; and Anne Arundel, 1.

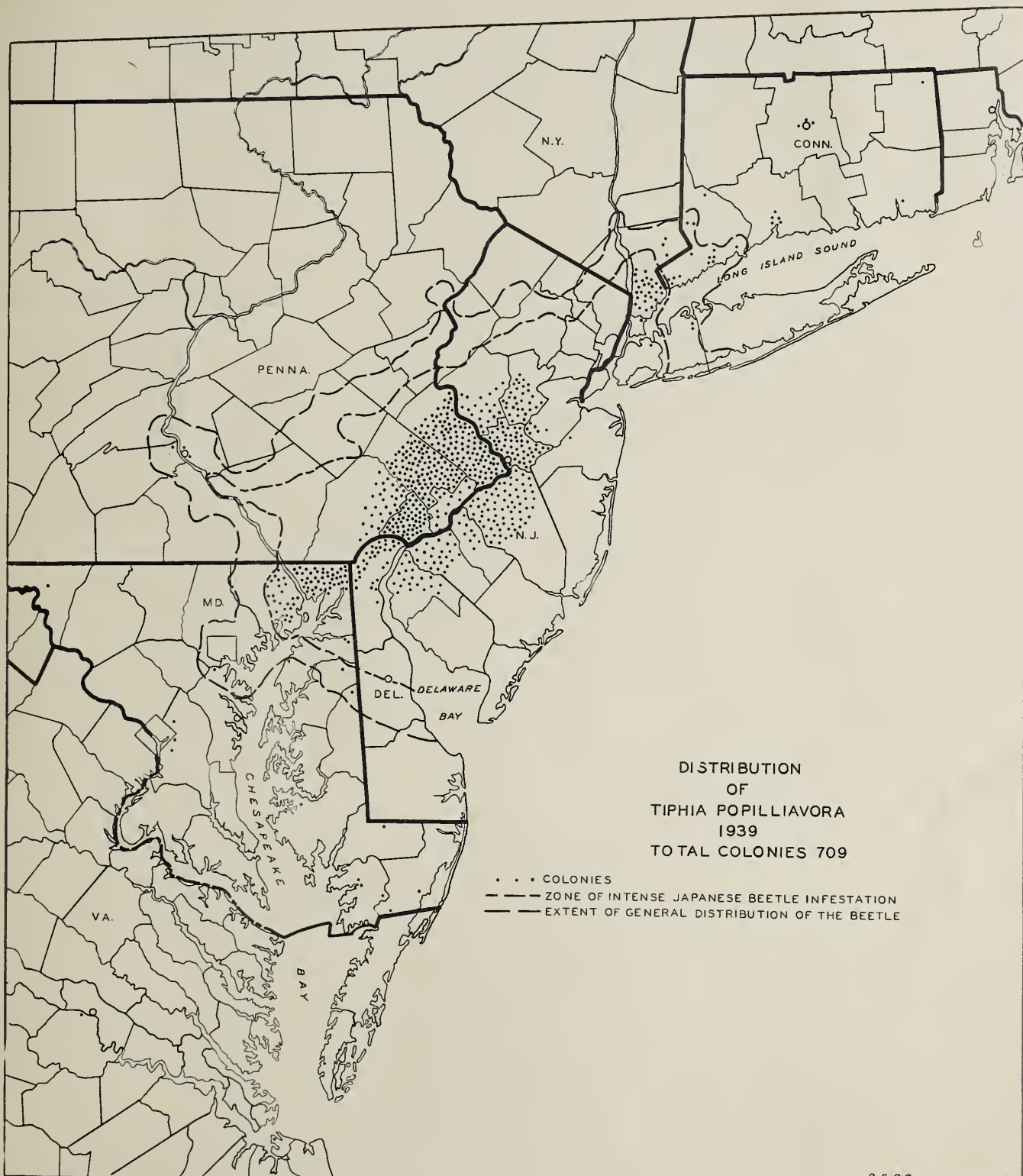
Colonization in New York.---The colonization of T. popilliavora in New York State continued on a cooperative basis with the State's representatives. In that State 19 colonies of this species were placed in 1939, thus bringing the total to 34 colonies. The 1939 releasements were as follows: Westchester County, 18; and New York County, 1.

Colonization in Virginia.---At the request of the State entomologist, three colonies of T. popilliavora were released in the infested areas of Virginia, one in each of the following counties: Chesterfield, Norfolk, and Northampton.

Colonization in New Jersey.--- One releasement was made in Middlesex County in 1939.

The accompanying map shows in general the total distribution of the 709 colonies of T. popilliavora.





DISTRIBUTION  
OF  
TIPHIA POPILLIAVORA  
1939  
TOTAL COLONIES 709

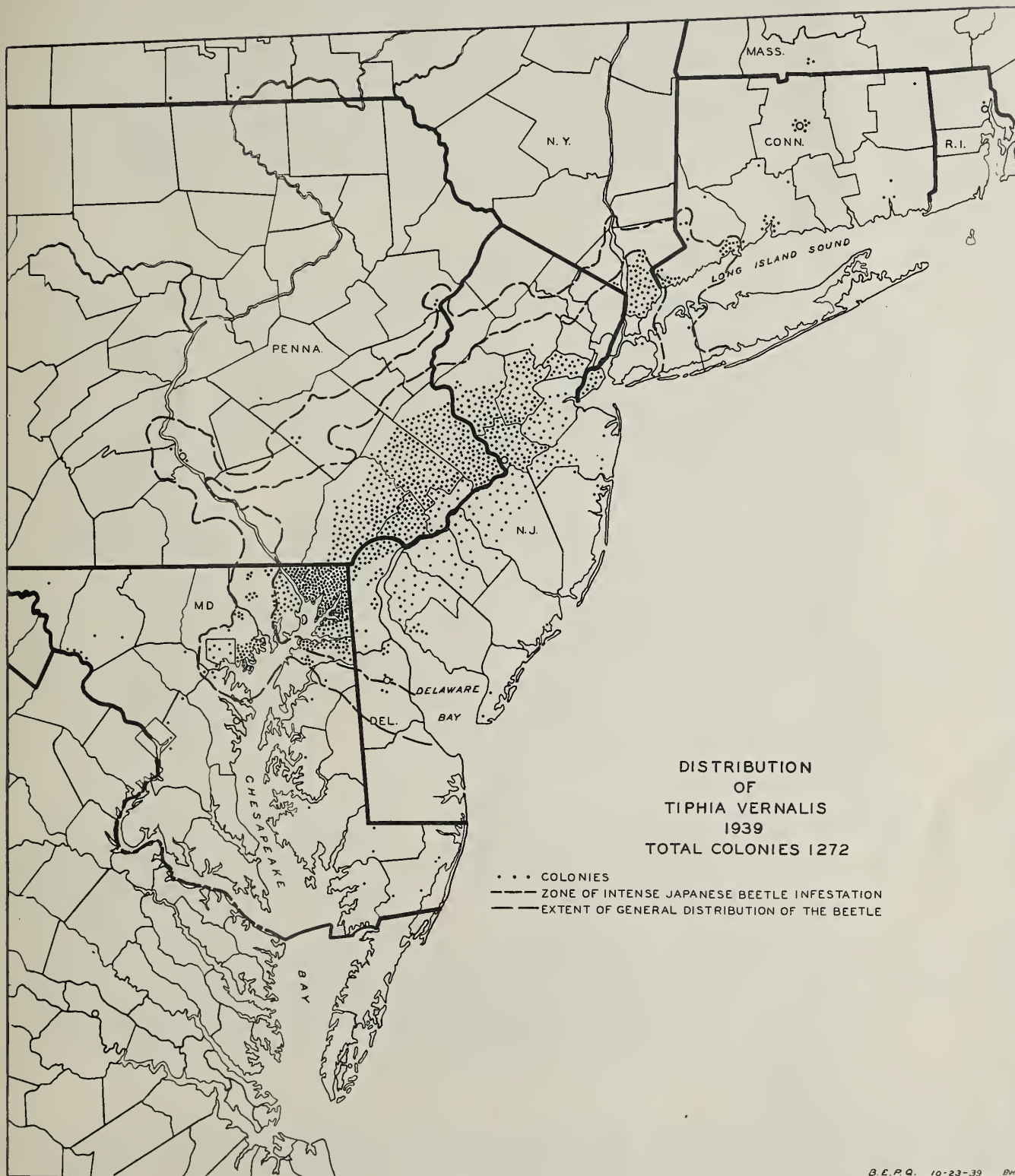
- • • COLONIES
- - - ZONE OF INTENSE JAPANESE BEETLE INFESTATION
- EXTENT OF GENERAL DISTRIBUTION OF THE BEETLE



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